

SEQUENCE LISTING

<110> Aventis Pasteur Limited
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 Raudonikiene, Ausra
 Gallichan, Scott
 Murdin, Andrew

<120> Chlamydia mgp002

<130> APL-03-03-PCT

<150> 60/481,690

<151> 2003-11-21

<160> 14

<170> PatentIn version 3.3

<210> 1

<211> 1698

<212> DNA

<213> Chlamydia muridarum

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<221> CDS

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Leu Cys Gln Lys Ser Ile Pro Gln Ala Leu Glu Ser Tyr Leu Glu Ala	
35 40 45	

tct aca acc tat caa caa cat aac ttt tct ata ttg cgc tta ata gct	192
Ser Thr Thr Tyr Gln Gln His Asn Phe Ser Ile Leu Arg Leu Ile Ala	
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aag tca tac tta caa caa agt ccc ccc ccc gaa gaa gct tac gta cgc	240
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65 70 75 80	

aaa agc gca att att gga gcg ggg ctt tct ggc tca tct gag act cta	288
Lys Ser Ala Ile Ile Gly Ala Gly Leu Ser Gly Ser Ser Glu Thr Leu	
85 90 95	

gat cta ctg tct gaa tcc ata gaa aca cag gat ctt tat gag cag cta	336
Asp Leu Leu Ser Glu Ser Ile Glu Thr Gln Asp Leu Tyr Glu Gln Leu	
100 105 110	

ctt aac tca aat gct gca ggc aat caa tta ggc aaa act tcc gat cgt Leu Ile Leu Asn Ala Ala Gly Asn Gln Leu Gly Lys Thr Ser Asp Arg 115 120 125	384
ctt tta ttc aaa gga tta aca gca cct cat cct att att cgc ttg gaa Leu Leu Phe Lys Gly Leu Thr Ala Pro His Pro Ile Ile Arg Leu Glu 130 135 140	432
gct gct tac cgt ctg gcc tgg atg aaa aac agt aaa gta agt gac tac Ala Ala Tyr Arg Leu Ala Cys Met Lys Asn Ser Lys Val Ser Asp Tyr 145 150 155 160	480
ctc tat tct ttt atc cac cag ctt cca gaa gaa atc caa aac tta gca Leu Tyr Ser Phe Ile His Gln Leu Pro Glu Glu Ile Gln Asn Leu Ala 165 170 175	528
gca acg att ttt ttg cag ctc gaa acg gaa gaa gca gat gct tat gtt Ala Thr Ile Phe Leu Gln Leu Glu Thr Glu Glu Ala Asp Ala Tyr Val 180 185 190	576
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tat cta att gga gaa tat caa cag agg aga ttt ctt cca acg ctc cgc Tyr Leu Ile Gly Glu Tyr Gln Gln Arg Arg Phe Leu Pro Thr Leu Arg 210 215 220	672
tcg ttg ctt acc agc gca gct cct tta gac caa gaa gga tct ttg tat Ser Leu Leu Thr Ser Ala Ala Pro Leu Asp Gln Glu Gly Ser Leu Tyr 225 230 235 240	720
gct ata gga aaa tta gaa gat gcc agc agc tat cct aaa atc aaa gca Ala Ile Gly Lys Leu Glu Asp Ala Ser Ser Tyr Pro Lys Ile Lys Ala 245 250 255	768
tta agc tcc aaa tct aac cct gaa gtg gct ctt gct gct gct cag aca Leu Ser Ser Lys Ser Asn Pro Glu Val Ala Leu Ala Ala Gln Thr 260 265 270	816
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Ser Lys Ala Ala Leu Thr Pro Gly Asp Pro Ile Ile Arg Ala Tyr Ala			
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Leu Tyr Gln Tyr Ala Glu Gln Leu Ile Gly Asp Thr Ile Leu Phe Thr			
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Thr Leu Val Ser Ser Lys Thr Asp Glu Asp Ile Arg Val Phe Leu Ser			
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35 40 45

Ser Thr Thr Tyr Gln Gln His Asn Phe Ser Ile Leu Arg Leu Ile Ala
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Leu Leu Phe Lys Gly Leu Thr Ala Pro His Pro Ile Ile Arg Leu Glu
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Leu Tyr Ser Phe Ile His Gln Leu Pro Glu Glu Ile Gln Asn Leu Ala
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Ala Thr Ile Phe Leu Gln Leu Glu Thr Glu Glu Ala Asp Ala Tyr Val
180 185 190

His Arg Leu Leu Ser Ser Pro Asn Ser Leu Thr Arg Asn Tyr Met Ala
195 200 205

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Phe Cys Gln Gln Glu Leu Pro Arg Ala Ile Tyr Thr Ser Arg Phe Leu
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325 330 335

Gly Ser Val Asn His Leu Val Leu Ser Tyr Leu Thr Glu Phe Leu Glu
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Gln Val Ser Pro Glu Thr Arg Ser Gln Leu Met Leu Thr Ile Leu Glu
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Thr Leu Val Ser Ser Lys Thr Asp Glu Asp Ile Arg Val Phe Leu Ser
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tca	gca	act	tat	caa	caa	cac	gat	ttc	tcc	gta	tta	cgc	gta	ata	gca	192
Ser	Ala	Thr	Tyr	Gln	Gln	His	Asp	Phe	Ser	Val	Leu	Arg	Val	Ile	Ala	
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gaa	tgc	tat	tta	caa	caa	agc	ttt	ctc	tct	gag	gac	acc	tac	ata	cgt	240
Glu	Ser	Tyr	Leu	Gln	Gln	Ser	Phe	Leu	Ser	Glu	Asp	Thr	Tyr	Ile	Arg	
65							70			75			80			
aaa	agt	gca	att	att	gga	gca	ggg	cta	tct	ggt	tca	tca	gaa	gct	tta	288
Lys	Ser	Ala	Ile	Ile	Gly	Ala	Gly	Leu	Ser	Gly	Ser	Ser	Glu	Ala	Leu	
85							90						95			
gag	tta	ctg	tct	gag	gct	ata	gaa	acg	caa	gat	ctc	tat	gag	caa	cta	336
Glu	Leu	Leu	Ser	Glu	Ala	Ile	Glu	Thr	Gln	Asp	Leu	Tyr	Glu	Gln	Leu	
100							105						110			
ctc	att	tta	aat	gct	gca	acc	agc	caa	tta	agc	aaa	act	tct	gac	aaa	384
Leu	Ile	Leu	Asn	Ala	Ala	Thr	Ser	Gln	Leu	Ser	Lys	Thr	Ser	Asp	Lys	
115							120						125			
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Leu	Leu	Phe	Lys	Gly	Leu	Thr	Ala	Ser	His	Pro	Val	Ile	Arg	Leu	Glu	
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145							150						160			
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Leu	Tyr	Ser	Phe	Ile	Tyr	Lys	Leu	Pro	Glu	Glu	Ile	Gln	Asn	Leu	Ala	
165							170						175			
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180							185						190			
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His	His	Leu	Leu	Ser	Ser	Pro	Asn	Asn	Leu	Thr	Arg	Asn	Tyr	Val	Ala	
195							200						205			
tat	tta	att	gga	gag	tac	aaa	caa	aaa	aga	ttt	ctt	cca	aca	cta	cgc	672
Tyr	Leu	Ile	Gly	Glu	Tyr	Lys	Gln	—Lys	Arg	Phe	Leu	Pro	Thr	Leu	Arg	
210							215						220			
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tcg caa gag aag ggt gaa gag ctt ctt cca atc ttt tat aac gca Ser Gln Glu Lys Gly Glu Glu Leu Leu Pro Ile Phe Tyr Asn Ala 305	310	315	960
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gct ata cag ttc tgg aaa gaa tgc acc act ttt cct ctc atg agc caa Ala Ile Gln Phe Trp Lys Glu Cys Thr Thr Phe Pro Leu Met Ser Gln 370	375	380	1152
gaa gac aaa atg aga acg ttg gct atg tat cgg gta gcg gaa gat acc Glu Asp Lys Met Arg Thr Leu Ala Met Tyr Arg Val Ala Glu Asp Thr 385	390	395	1200
atc ctc tca gcg tta cta aaa tta ccc aat gac gcc tat ctt cct tac Ile Leu Ser Ala Leu Lys Leu Pro Asn Asp Ala Tyr Leu Pro Tyr 405	410	415	1248
cta gag cgc atc ctc gcc tca caa aaa act ata cta gca gct aaa gct Leu Glu Arg Ile Leu Ala Ser Gln Lys Thr Ile Leu Ala Ala Lys Ala 420	425	430	1296
att gct ttt tta tcg gta aca gct cat cct cag gca ctt tct tta gtc Ile Ala Phe Leu Ser Val Thr Ala His Pro Gln Ala Leu Ser Leu Val 435	440	445	1344
tcg aaa gct gca tta act cct gga gac cct atc att cgc gct tac gct Ser Lys Ala Ala Leu Thr Pro Gly Asp Pro Ile Ile Arg Ala Tyr Ala 450	455	460	1392
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gat gct gaa aat ccg ctt ccc tct cca agc tct tct tat tta cgc tac 1536
 Asp Ala Glu Asn Pro Leu Pro Ser Pro Ser Ser Ser Tyr Leu Arg Tyr
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caa gta tcc cct gag acc cgc aca caa ctt atg cta gct att ttg gaa 1584
 Gln Val Ser Pro Glu Thr Arg Thr Gln Leu Met Leu Ala Ile Leu Glu
 515 520 525

acc tta gtt tct tcc aaa acg gat gaa gat atc cgc gtt ttt ctt tcc 1632
 Thr Leu Val Ser Ser Lys Thr Asp Glu Asp Ile Arg Val Phe Leu Ser
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cta atg aaa aaa acc cat tac aaa aat atc ccg atc tta tca gga ttg 1680
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Ser Cys Arg Lys Ser Val Pro Gln Ala Leu Glu Ala Tyr Leu Glu Ala
 35 40 45

Ser Ala Thr Tyr Gln Gln His Asp Phe Ser Val Leu Arg Val Ile Ala
 50 55 60

Glu Ser Tyr Leu Gln Gln Ser Phe Leu Ser Glu Asp Thr Tyr Ile Arg
 65 70 75 80

Lys Ser Ala Ile Ile Gly Ala Gly Leu Ser Gly Ser Ser Glu Ala Leu
 85 90 95

Glu Leu Leu Ser Glu Ala Ile Glu Thr Gln Asp Leu Tyr Glu Gln Leu
100 105 110

Leu Ile Leu Asn Ala Ala Thr Ser Gln Leu Ser Lys Thr Ser Asp Lys
115 120 125

Leu Leu Phe Lys Gly Leu Thr Ala Ser His Pro Val Ile Arg Leu Glu
130 135 140

Ala Ala Tyr Arg Leu Ala Cys Met Lys Asn Ser Lys Val Ser Asp Tyr
145 150 155 160

Leu Tyr Ser Phe Ile Tyr Lys Leu Pro Glu Glu Ile Gln Asn Leu Ala
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Ala Thr Ile Phe Leu Gln Leu Glu Thr Glu Glu Ala Asp Ala Tyr Ile
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260 265 270

Leu Leu Phe Leu Glu Lys Glu Glu Glu Ala Leu Pro Ile Leu Thr Asn
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Leu Cys Gln Gln Lys Leu Leu Arg Ala Leu Tyr Thr Ala Arg Phe Leu
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Ser Gln Glu Lys Gly Glu Glu Leu Leu Leu Pro Ile Phe Tyr Asn Ala
305 310 315 320

325

330

335

Gly Cys Thr Asp Pro Gln Val Leu His Tyr Leu Thr Glu Ile Leu Glu
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Ser Lys Val Leu His Arg Ile Phe Leu Pro Thr His Ser Thr Gly Lys
355 360 365

Ala Ile Gln Phe Trp Lys Glu Cys Thr Thr Phe Pro Leu Met Ser Gln
370 375 380

Glu Asp Lys Met Arg Thr Leu Ala Met Tyr Arg Val Ala Glu Asp Thr
385 390 395 400

Ile Leu Ser Ala Leu Leu Lys Leu Pro Asn Asp Ala Tyr Leu Pro Tyr
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Leu Glu Arg Ile Leu Ala Ser Gln Lys Thr Ile Leu Ala Ala Lys Ala
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Ile Ala Phe Leu Ser Val Thr Ala His Pro Gln Ala Leu Ser Leu Val
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Ser Lys Ala Ala Leu Thr Pro Gly Asp Pro Ile Ile Arg Ala Tyr Ala
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Asn Leu Ala Leu Tyr Thr Met Thr Lys Asp Pro Glu Lys Lys Ala Val
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485 490 495

Asp Ala Glu Asn Pro Leu Pro Ser Pro Ser Ser Ser Tyr Leu Arg Tyr
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Gln Val Ser Pro Glu Thr Arg Thr Gln Leu Met Leu Ala Ile Leu Glu
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 Gln Lys Ser Ile Pro Gln Ala Leu Glu Ser Tyr Leu Glu Ala Ser Thr
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 Thr Tyr Gln Gln His Asn Phe Ser Ile Leu Arg Leu Ile Ala Lys Ser
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 Tyr Leu Gln Gln Ser Leu Phe Ser Glu Asp Ala Tyr Val Arg Lys Ser
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 Ala Ile Ile Gly Ala Gly Leu Ser Gly Ser Ser Glu Thr Leu Asp Leu
 65 70 75 80

ctg tct gaa tcc ata gaa aca cag gat ctt tat gag cag cta ctt att
 Leu Ser Glu Ser Ile Glu Thr Gln Asp Leu Tyr Glu Gln Leu Leu Ile
 85 90 95

tta aat gct gca ggc aat caa tta ggc aaa act tcc gat cgt ctt tta
 Leu Asn Ala Ala Gly Asn Gln Leu Gly Lys Thr Ser Asp Arg Leu Leu
 100 105 110

ttc aaa gga tta aca gca cct cat cct att att cgc ttg gaa gct gct
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 115 120 125

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 Tyr Arg Leu Ala Cys Met Lys Asn Ser Lys Val Ser Asp Tyr Leu Tyr
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48

96

144

192

240

288

336

384

432

480

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165	170	175		
ctc ctg tct tct cct aat agt cta aca aga aac tat atg gct tat cta				576
Leu Leu Ser Ser Pro Asn Ser Leu Thr Arg Asn Tyr Met Ala Tyr Leu				
180	185	190		
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195	200	205		
ctt acc agc gca gct cct tta gac caa gaa gga tct ttg tat gct ata				672
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gga aaa tta gaa gat gcc agc agc tat cct aaa atc aaa gca tta agc				720
Gly Lys Leu Glu Asp Ala Ser Ser Tyr Pro Lys Ile Lys Ala Leu Ser				
225	230	235	240	
tcc aaa tct aac cct gaa gtg gct ctt gct gct cag aca tta tta				768
Ser Lys Ser Asn Pro Glu Val Ala Leu Ala Ala Gln Thr Leu Leu				
245	250	255		
ttc ttg ggt aaa gaa gat gag gct ctt cct atc cta act act ttt tgc				816
Phe Leu Gly Lys Glu Asp Glu Ala Leu Pro Ile Leu Thr Thr Phe Cys				
260	265	270		
cag caa gag ctt cct cga gct att tat acc tct cgt ttc ctt tca tta				864
Gln Gln Glu Leu Pro Arg Ala Ile Tyr Thr Ser Arg Phe Leu Ser Leu				
275	280	285		
gaa aaa gga gaa gag ctt ctt tta ccc atc ttt tgt aaa gct att aaa				912
Glu Lys Gly Glu Glu Leu Leu Pro Ile Phe Cys Lys Ala Ile Lys				
290	295	300		
gaa gaa att aaa ctg aat gct gct ttg gct ctt gtc cac ttg gga agc				960
Glu Glu Ile Lys Leu Asn Ala Ala Leu Ala Leu Val His Leu Gly Ser				
305	310	315	320	
gtt aat cac cta gtg ctt agt tat tta aca gaa ttt tta gaa aat aaa				1008
Val Asn His Leu Val Leu Ser Tyr Leu Thr Glu Phe Leu Glu Asn Lys				
325	330	335		
att ctc cac cgc ata ttt tta ccc acc cat tcg ata gga aaa gcc acg				1056
Ile Leu His Arg Ile Phe Leu Pro Thr His Ser Ile Gly Lys Ala Thr				
340	345	350		
cag ttt tgg aaa gag tgt acg gca ctc cct ctt cta agc cca gaa gaa				1104
Gln Phe Trp Lys Glu Cys Thr Ala Leu Pro Leu Leu Ser Pro Glu Glu				
355	360	365		
aaa gca aga gct ttg gca atg tat cgc gca gca gaa gat acg atc ctc				1152

370

375

380

tct	agt	tta	tta	aaa	tta	cct	aac	aat	gcc	tat	ctg	cct	tat	ttg	gaa	1200
Ser	Ser	Leu	Leu	Lys	Leu	Pro	Asn	Asn	Ala	Tyr	Leu	Pro	Tyr	Leu	Glu	
385					390				395				400			
cgt	att	cta	act	tca	caa	aaa	acc	cct	cta	gca	gct	aaa	gct	att	gct	1248
Arg	Ile	Leu	Thr	Ser	Gln	Lys	Thr	Pro	Leu	Ala	Ala	Lys	Ala	Ile	Ala	
					405				410				415			
ttt	tta	tca	gta	aca	gct	cat	cct	cag	gca	ctt	tct	tta	gtc	tcg	aaa	1296
Phe	Leu	Ser	Val	Thr	Ala	His	Pro	Gln	Ala	Leu	Ser	Leu	Val	Ser	Lys	
					420				425				430			
gca	gca	cta	act	cca	gga	gac	cct	atc	att	cgc	gct	tat	gcg	aat	tta	1344
Ala	Ala	Leu	Thr	Pro	Gly	Asp	Pro	Ile	Ile	Arg	Ala	Tyr	Ala	Asn	Leu	
					435				440				445			
gct	tta	tat	aca	atg	acg	caa	gat	cct	gaa	aag	aaa	gcc	tta	tta	tat	1392
Ala	Leu	Tyr	Thr	Met	Thr	Gln	Asp	Pro	Glu	Lys	Lys	Ala	Leu	Leu	Tyr	
					450				455				460			
caa	tat	gcc	gaa	cag	tta	ata	gga	gac	acg	att	ttg	ttt	aca	gat	gag	1440
Gln	Tyr	Ala	Glu	Gln	Leu	Ile	Gly	Asp	Thr	Ile	Leu	Phe	Thr	Asp	Glu	
					465				470				475			480
gag	aat	ccc	ctg	cct	tct	ccc	cat	tct	tcc	tac	ctg	cga	tat	caa	gtg	1488
Glu	Asn	Pro	Leu	Pro	Ser	Pro	His	Ser	Ser	Tyr	Leu	Arg	Tyr	Gln	Val	
					485				490				495			
tcc	cca	gaa	act	cgt	tct	caa	ctc	atg	cta	act	att	tta	gaa	acc	cta	1536
Ser	Pro	Glu	Thr	Arg	Ser	Gln	Leu	Met	Leu	Thr	Ile	Leu	Glu	Thr	Ieu	
					500				505				510			
gtt	tct	tct	aaa	act	gat	gaa	gac	atc	cga	gtt	ttt	ctt	tcg	cta	atg	1584
Val	Ser	Ser	Lys	Thr	Asp	Glu	Asp	Ile	Arg	Val	Phe	Leu	Ser	Leu	Met	
					515				520				525			
aaa	aaa	acc	cat	tac	aaa	aat	atc	ccc	atc	tta	tct	gga	tta	tta	atg	1632
Lys	Lys	Thr	His	Tyr	Lys	Asn	Ile	Pro	Ile	Leu	Ser	Gly	Leu	Leu	Met	
					530				535				540			
aga	ata	gtg	gag	cga	gct	cgg	tac	caa	gct	tac	gta	gaa	caa	aaa	ctc	1680
Arg	Ile	Val	Glu	Arg	Ala	Arg	Tyr	Gln	Ala	Tyr	Val	Glu	Gln	Lys	Leu	
					545				550				555			560
atc	tca	gaa	gag	gat												1695
Ile	Ser	Glu	Glu	Asp												
				565												

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Met Cys Asp Phe Pro Pro Ser Val Ser Gln Lys Ile Leu Phe Leu Cys
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Gln Lys Ser Ile Pro Gln Ala Leu Glu Ser Tyr Leu Glu Ala Ser Thr
20 25 30

Thr Tyr Gln Gln His Asn Phe Ser Ile Leu Arg Leu Ile Ala Lys Ser
35 40 45

Tyr Leu Gln Gln Ser Leu Phe Ser Glu Asp Ala Tyr Val Arg Lys Ser
50 55 60

Ala Ile Ile Gly Ala Gly Leu Ser Gly Ser Ser Glu Thr Leu Asp Leu
65 70 75 80

Leu Ser Glu Ser Ile Glu Thr Gln Asp Leu Tyr Glu Gln Leu Leu Ile
85 90 95

Leu Asn Ala Ala Gly Asn Gln Leu Gly Lys Thr Ser Asp Arg Leu Leu
100 105 110

Phe Lys Gly Leu Thr Ala Pro His Pro Ile Ile Arg Leu Glu Ala Ala
115 120 125

Tyr Arg Leu Ala Cys Met Lys Asn Ser Lys Val Ser Asp Tyr Leu Tyr
130 135 140

Ser Phe Ile His Gln Leu Pro Glu Glu Ile Gln Asn Leu Ala Ala Thr
145 150 155 160

Ile Phe Leu Gln Leu Glu Thr Glu Glu Ala Asp Ala Tyr Val His Arg
165 170 175

Leu Leu Ser Ser Pro Asn Ser Leu Thr Arg Asn Tyr Met Ala Tyr Leu
180 185 190

Ile Gly Glu Tyr Gln Gln Arg Arg Phe Leu Pro Thr Leu Arg Ser Leu
195 200 205

Leu Thr Ser Ala Ala Pro Leu Asp Gln Glu Gly Ser Leu Tyr Ala Ile
210 215 220

Gly Lys Leu Glu Asp Ala Ser Ser Tyr Pro Lys Ile Lys Ala Leu Ser
225 230 235 240

Ser Lys Ser Asn Pro Glu Val Ala Leu Ala Ala Ala Gln Thr Leu Leu
245 250 255

Phe Leu Gly Lys Glu Asp Glu Ala Leu Pro Ile Leu Thr Thr Phe Cys
260 265 270

Gln Gln Glu Leu Pro Arg Ala Ile Tyr Thr Ser Arg Phe Leu Ser Leu
275 280 285

Glu Lys Gly Glu Glu Leu Leu Leu Pro Ile Phe Cys Lys Ala Ile Lys
290 295 300

Glu Glu Ile Lys Leu Asn Ala Ala Leu Ala Leu Val His Leu Gly Ser
305 310 315 320

Val Asn His Leu Val Leu Ser Tyr Leu Thr Glu Phe Leu Glu Asn Lys
325 330 335

Ile Leu His Arg Ile Phe Leu Pro Thr His Ser Ile Gly Lys Ala Thr
340 345 350

Gln Phe Trp Lys Glu Cys Thr Ala Leu Pro Leu Leu Ser Pro Glu Glu
355 360 365

Lys Ala Arg Ala Leu Ala Met Tyr Arg Ala Ala Glu Asp Thr Ile Leu
370 375 380

Ser Ser Leu Leu Lys Leu Pro Asn Asn Ala Tyr Leu Pro Tyr Leu Glu
385 390 395 400

Arg Ile Leu Thr Ser Gln Lys Thr Pro Leu Ala Ala Lys Ala Ile Ala
405 410 415

Phe Leu Ser Val Thr Ala His Pro Gln Ala Leu Ser Leu Val Ser Lys
420 425 430

Ala Ala Leu Thr Pro Gly Asp Pro Ile Ile Arg Ala Tyr Ala Asn Leu
435 440 445

Ala Leu Tyr Thr Met Thr Gln Asp Pro Glu Lys Lys Ala Leu Leu Tyr
 450 455 460

Gln Tyr Ala Glu Gln Leu Ile Gly Asp Thr Ile Leu Phe Thr Asp Glu
 465 470 475 480

Glu Asn Pro Leu Pro Ser Pro His Ser Ser Tyr Leu Arg Tyr Gln Val
 485 490 495

Ser Pro Glu Thr Arg Ser Gln Leu Met Leu Thr Ile Leu Glu Thr Leu
 500 505 510

Val Ser Ser Lys Thr Asp Glu Asp Ile Arg Val Phe Leu Ser Leu Met
 515 520 525

Lys Lys Thr His Tyr Lys Asn Ile Pro Ile Leu Ser Gly Leu Leu Met
 530 535 540

Arg Ile Val Glu Arg Ala Arg Tyr Gln Ala Tyr Val Glu Gln Lys Leu
 545 550 555 560

Ile Ser Glu Glu Asp
 565

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 cga aaa tca gtc cct caa gct cta gaa gcc tat ctc gaa gct tca gca 96
 Arg Lys Ser Val Pro Gln Ala Leu Glu Ala Tyr Leu Glu Ala Ser Ala
 20 25 30
 act tat caa caa cac gat ttc tcc gta tta cgc gta ata gca gaa tcg
 Thr Tyr Gln Gln His Asp Phe Ser Val Leu Arg Val Ile Ala Glu Ser 144
 35 40 45

Tyr	Leu	Gln	Gln	Ser	Phe	Leu	Ser	Glu	Asp	Thr	Tyr	Ile	Arg	Lys	Ser	
50					55					60						
gca	att	att	gga	gca	ggg	cta	tct	ggt	tca	tca	gaa	gct	tta	gag	tta	240
Ala	Ile	Ile	Gly	Ala	Gly	Leu	Ser	Gly	Ser	Ser	Glu	Ala	Leu	Glu	Leu	
65						70				75			80			
ctg	tct	gag	gct	ata	gaa	acg	caa	gat	ctc	tat	gag	caa	cta	ctc	att	288
Leu	Ser	Glu	Ala	Ile	Glu	Thr	Gln	Asp	Leu	Tyr	Glu	Gln	Leu	Ile		
						85			90			95				
tta	aat	gct	gca	acc	agc	caa	tta	agc	aaa	act	tct	gac	aaa	ctt	tta	336
Leu	Asn	Ala	Ala	Thr	Ser	Gln	Leu	Ser	Lys	Thr	Ser	Asp	Lys	Leu	Leu	
						100			105			110				
ttc	aag	gga	tta	aca	gct	tct	cat	cct	gtc	atc	cgc	tta	gaa	gct	gct	384
Phe	Lys	Gly	Leu	Thr	Ala	Ser	His	Pro	Val	Ile	Arg	Leu	Glu	Ala	Ala	
						115			120			125				
tat	cgt	ctt	gcc	tgt	atg	aaa	aat	agc	aag	gta	agt	gat	tac	ctt	tat	432
Tyr	Arg	Leu	Ala	Cys	Met	Lys	Asn	Ser	Lys	Val	Ser	Asp	Tyr	Leu	Tyr	
						130			135			140				
tct	ttt	atc	tac	aag	tta	cca	gaa	gaa	att	caa	aac	cta	gcg	gca	act	480
Ser	Phe	Ile	Tyr	Lys	Leu	Pro	Glu	Glu	Ile	Gln	Asn	Leu	Ala	Ala	Thr	
						145			150			155			160	
att	ttc	tta	caa	ctc	gaa	aca	gaa	gaa	gct	gat	gct	tat	att	cat	cat	528
Ile	Phe	Leu	Gln	Leu	Glu	Thr	Glu	Glu	Ala	Asp	Ala	Tyr	Ile	His	His	
						165			170			175				
ttg	ctc	tct	ccc	aat	aac	ctg	aca	aga	aac	tat	gtt	gcc	tat	tta		576
Leu	Leu	Ser	Pro	Asn	Asn	Leu	Thr	Arg	Asn	Tyr	Val	Ala	Tyr	Leu		
						180			185			190				
att	gga	gag	tac	aaa	caa	aaa	aga	ttt	ctt	cca	aca	cta	cgc	tct	tta	624
Ile	Gly	Glu	Tyr	Lys	Gln	Lys	Arg	Phe	Leu	Pro	Thr	Leu	Arg	Ser	Leu	
						195			200			205				
ctt	aca	agt	gcc	tct	cct	tta	gat	caa	gaa	ggc	gct	ttg	tat	gcg	tta	672
Leu	Thr	Ser	Ala	Ser	Pro	Leu	Asp	Gln	Glu	Gly	Ala	Leu	Tyr	Ala	Leu	
						210			215			220				
ggc	aaa	ctg	gaa	gac	tct	ggt	agc	tat	cct	aga	att	aaa	gct	cta	agc	720
Gly	Lys	Leu	Glu	Asp	Ser	Gly	Ser	Tyr	Pro	Arg	Ile	Lys	Ala	Leu	Ser	
						225			230			235			240	
tct	aga	tcc	aat	cct	gaa	gta	gta	ctc	gct	gca	gct	cag	aca	tta	tta	768
Ser	Arg	Ser	Asn	Pro	Glu	Val	Val	Leu	Ala	Ala	Ala	Gln	Thr	Leu	Leu	
						245			250			255				
ttc	tta	gag	aaa	gaa	gaa	gaa	gct	cta	ccg	atc	cta	acc	aac	ctt	tgc	816
Phe	Leu	Glu	Lys	Glu	Glu	Glu	Ala	Leu	Pro	Ile	Leu	Thr	Asn	Leu	Cys	
						260			265			270				
caa	caa	aaa	ctt	ctt	cga	gcc	ctg	tat	acc	gca	cgt	ttc	ctc	tcg	caa	864

275	280	285	
gag aag ggt gaa gag ctt ctt ctt cca atc ttt tat aac gca aca caa Glu Lys Gly Glu Glu Leu Leu Leu Pro Ile Phe Tyr Asn Ala Thr Gln 290	295	300	912
gaa gaa att aga ctg aat act gct tta gca ctt gtt cat caa ggg tgt Glu Glu Ile Arg Leu Asn Thr Ala Leu Ala Leu Val His Gln Gly Cys 305	310	315	960
aca gat cct caa gtc ctc cac tat cta aca gaa atc tta gaa agt aaa Thr Asp Pro Gln Val Leu His Tyr Leu Thr Glu Ile Leu Glu Ser Lys 325	330	335	1008
gtt ctc cat cgc ata ttt tta cct act cac tcg aca gga aaa gct ata Val Leu His Arg Ile Phe Leu Pro Thr His Ser Thr Gly Lys Ala Ile 340	345	350	1056
cag ttc tgg aaa gaa tgc acc act ttt cct ctc atg agc caa gaa gac Gln Phe Trp Lys Glu Cys Thr Thr Phe Pro Leu Met Ser Gln Glu Asp 355	360	365	1104
aaa atg aga acg ttg gct atg tat cgg gta gcg gaa gat acc atc ctc Lys Met Arg Thr Leu Ala Met Tyr Arg Val Ala Glu Asp Thr Ile Leu 370	375	380	1152
tca gcg tta cta aaa tta ccc aat gac gcc tat ctt cct tac cta gag Ser Ala Leu Leu Lys Leu Pro Asn Asp Ala Tyr Leu Pro Tyr Leu Glu 385	390	395	1200
cgc atc ctc gcc tca caa aaa act ata cta gca gct aaa gct att gct Arg Ile Leu Ala Ser Gln Lys Thr Ile Leu Ala Ala Lys Ala Ile Ala 405	410	415	1248
ttt tta tcg gta aca gct cat cct cag gca ctt tct tta gtc tcg aaa Phe Leu Ser Val Thr Ala His Pro Gln Ala Leu Ser Leu Val Ser Lys 420	425	430	1296
gct gca tta act cct gga gac cct atc att cgc gct tac gct aat cta Ala Ala Leu Thr Pro Gly Asp Pro Ile Ile Arg Ala Tyr Ala Asn Leu 435	440	445	1344
gct tta tat aca atg acc aaa gat cct gag aaa aaa gct gtg cta tac Ala Leu Tyr Thr Met Thr Lys Asp Pro Glu Lys Lys Ala Val Leu Tyr 450	455	460	1392
cga tat gct gaa caa tta ata gag gat acc att tta ttc aca gat gct Arg Tyr Ala Glu Gln Leu Ile Glu Asp Thr Ile Leu Phe Thr Asp Ala 465	470	475	1440
gaa aat ccg ctt ccc tct cca agc tct tct tat tta cgc tac caa gta Glu Asn Pro Leu Pro Ser Pro Ser Ser Tyr Leu Arg Tyr Gln Val 485	490	495	1488
tcc cct gag acc cgc aca caa ctt atg cta gct att ttg gaa acc tta Ser Pro Glu Thr Arg Thr Gln Leu Met Leu Ala Ile Leu Glu Thr Leu			1536

gtt tct tcc aaa acg gat gaa gat atc cgc gtt ttt ctt tcc cta atg	515	520	525	1584
Val Ser Ser Lys Thr Asp Glu Asp Ile Arg Val Phe Leu Ser Leu Met				
aaa aaa acc cat tac aaa aat atc ccg atc tta tca gga ttg tta atg	530	535	540	1632
Lys Lys Thr His Tyr Lys Asn Ile Pro Ile Leu Ser Gly Leu Leu Met				
aga ata gtg gag				1644
Arg Ile Val Glu				
545				
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Met Cys Asp Phe Pro Ser Ser Val Ser Gln Arg Ile Leu Phe Ser Cys	1	5	10	15
Arg Lys Ser Val Pro Gln Ala Leu Glu Ala Tyr Leu Glu Ala Ser Ala	20	25	30	
Thr Tyr Gln Gln His Asp Phe Ser Val Leu Arg Val Ile Ala Glu Ser	35	40	45	
Tyr Leu Gln Gln Ser Phe Leu Ser Glu Asp Thr Tyr Ile Arg Lys Ser	50	55	60	
Ala Ile Ile Gly Ala Gly Leu Ser Gly Ser Ser Glu Ala Leu Glu Leu	65	70	75	80
Leu Ser Glu Ala Ile Glu Thr Gln Asp Leu Tyr Glu Gln Leu Leu Ile	85	90	95	
Leu Asn Ala Ala Thr Ser Gln Leu Ser Lys Thr Ser Asp Lys Leu Leu	100	105	110	
Phe Lys Gly Leu Thr Ala Ser His Pro Val Ile Arg Leu Glu Ala Ala	115	120	125	
Tyr Arg Leu Ala Cys Met Lys Asn Ser Lys Val Ser Asp Tyr Leu Tyr	130	135	140	

Ser Phe Ile Tyr Lys Leu Pro Glu Glu Ile Gln Asn Leu Ala Ala Thr
145 150 155 160

Ile Phe Leu Gln Leu Glu Thr Glu Glu Ala Asp Ala Tyr Ile His His
165 170 175

Leu Leu Ser Ser Pro Asn Asn Leu Thr Arg Asn Tyr Val Ala Tyr Leu
180 185 190

Ile Gly Glu Tyr Lys Gln Lys Arg Phe Leu Pro Thr Leu Arg Ser Leu
195 200 205

Leu Thr Ser Ala Ser Pro Leu Asp Gln Glu Gly Ala Leu Tyr Ala Leu
210 215 220

Gly Lys Leu Glu Asp Ser Gly Ser Tyr Pro Arg Ile Lys Ala Leu Ser
225 230 235 240

Ser Arg Ser Asn Pro Glu Val Val Leu Ala Ala Ala Gln Thr Leu Leu
245 250 255

Phe Leu Glu Lys Glu Glu Glu Ala Leu Pro Ile Leu Thr Asn Leu Cys
260 265 270

Gln Gln Lys Leu Leu Arg Ala Leu Tyr Thr Ala Arg Phe Leu Ser Gln
275 280 285

Glu Lys Gly Glu Glu Leu Leu Pro Ile Phe Tyr Asn Ala Thr Gln
290 295 300

Glu Glu Ile Arg Leu Asn Thr Ala Leu Ala Leu Val His Gln Gly Cys
305 310 315 320

Thr Asp Pro Gln Val Leu His Tyr Leu Thr Glu Ile Leu Glu Ser Lys
325 330 335

Val Leu His Arg Ile Phe Leu Pro Thr His Ser Thr Gly Lys Ala Ile
340 345 350

Gln Phe Trp Lys Glu Cys Thr Thr Phe Pro Leu Met Ser Gln Glu Asp
355 360 365

370

375

380

Ser Ala Leu Leu Lys Leu Pro Asn Asp Ala Tyr Leu Pro Tyr Leu Glu
385 390 395 400

Arg Ile Leu Ala Ser Gln Lys Thr Ile Leu Ala Ala Lys Ala Ile Ala
405 410 415

Phe Leu Ser Val Thr Ala His Pro Gln Ala Leu Ser Leu Val Ser Lys
420 425 430

Ala Ala Leu Thr Pro Gly Asp Pro Ile Ile Arg Ala Tyr Ala Asn Leu
435 440 445

Ala Leu Tyr Thr Met Thr Lys Asp Pro Glu Lys Lys Ala Val Leu Tyr
450 455 460

Arg Tyr Ala Glu Gln Leu Ile Glu Asp Thr Ile Leu Phe Thr Asp Ala
465 470 475 480

Glu Asn Pro Leu Pro Ser Pro Ser Ser Tyr Leu Arg Tyr Gln Val
485 490 495

Ser Pro Glu Thr Arg Thr Gln Leu Met Leu Ala Ile Leu Glu Thr Leu
500 505 510

Val Ser Ser Lys Thr Asp Glu Asp Ile Arg Val Phe Leu Ser Leu Met
515 520 525

Lys Lys Thr His Tyr Lys Asn Ile Pro Ile Leu Ser Gly Leu Leu Met
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Arg Ile Val Glu

545

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41

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<210> 11
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<210> 12
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<210> 14
<211> 36
<212> DNA
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